CLIO MEDICA

THE BEGINNINGS: EGYPT & ASSYRIA

WARREN R. DAWSON

CLIO MEDICA

A SERIES OF PRIMERS ON THE HISTORY OF MEDICINE

EDITOR: E. B. KRUMBHAAR, M.D.

I

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THE BEGINNINGS · EGYPT & ASSYRIA

BY

WARREN R. DAWSON, F.R.S.E.

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EDITOR'S PREFACE

This little volume inaugurates a series of handbooks which under the general title of "Clio Medica" aims at presenting in a concise and readable form a number of special phases of the long and complex history that underlies the great edifice of modern medical science.

Since the times of the Aldines and Elzevirs, small easily portable booklets have been popular with the intelligent reader. Today books that add no appreciable burden to the coat pocket are real helps to the busy worker or student in gaining ready access to considerable worth-while reading. Such booklets, too, seem peculiarly appropriate for a new line of approach to such a subject as the History of Medicine from a different point of view than has hitherto maintained. From the very nature of this subject, when treated in a general way, it has thus far appeared either in ponderous tomes or, if in smaller volumes, in such scanty garb that almost no details of the costume are discernible. Then, too, the strictly chronological method of approach, with emphasis on prominent individuals becomes, almost a necessary form of treatment in the comprehensive general histories. The searcher for knowledge of the history of some small branch of the subject—a specialty, say, or the progress of medicine in this or that country—is thus forced to hunt, often painfully with help of index and marker, through the pages of the larger book or books, to be rewarded with a necessarily disconnected and usually incomplete presentation.

Our hope is that the series "Clio Medica" will obviate these difficulties. Conveniently small and inexpensive, yet prepared by recognized authorities in their chosen field, each volume will aim to present the story of some individualized phase of the history of medicine in such compact, connected, convincing and reasonably complete form that the medical undergraduate, the specialist, the busy general practitioner and the "intelligent layman" will all be attracted to a few hours reading, which in many cases will doubtless prove the introduction of an awakened interest to a more comprehensive study.

An increasing interest has recently become manifest in the history of medicine in the English speaking as well as in other countries, as is shown by the successful formation of new societies, journals and institutes for the study of the subject. The times, then, seem auspicious for this venture. Several volumes of the series are already in course of preparation; as these materialize more will be undertaken with the possibility of a large number being attained. We bespeak the support of our colleagues and friends and pray that the Goddess whose name we have used to designate our series may deign to foster the undertaking!

E. B. KRUMBHAAR.

PHILADELPHIA, PA.

PREFACE

From Egypt and Assyria have come down to us the earliest medical documents in the world, and as these must form the starting point of all studies in the history of medicine it is logical that a brief account of them should precede the volumes that will deal with the medical progress of other ages and of other lands. The beginnings of medicine are inextricably bound up with the dawn of human thought and progress, and the physical conditions of the Nile Valley that made possible the growth of an almost precocious civilization in very early times have also preserved for us the actual records of this ancient intellectual activity. The distinctive and curious custom of mummifying the dead, so characteristic of ancient Egypt, has had a profound influence on the growth of medical knowledge, for although embalming was a religious and not a medical observance, it afforded opportunities for acquiring a knowledge of the internal structure of the body, and, more important still, it overcame the popular prejudice against cutting the dead human body that enabled the Greek anatomists to carry out systematic dissection in Alexandria and elsewhere in Egypt.

This little book will show, I hope, that the aims of the embalmer and of the physician were identical in essence: both sought to prolong life, a phase of human activity that is shown in the age-long endeavour of man to find the Elixir of Life.

For the more advanced student, I have covered the same ground in much greater detail and with abundant bibliographical references in my book, "Magician and Leech," and in a large series of memoirs contributed to various British and American scientific journals, a number of special points has been more fully considered.

All these contributions I have based upon the direct and prolonged study of the texts themselves, and I hope that I have thereby acquired a truer sense of their real significance than can be gleaned from the statements, many of them inaccurate and misleading, that have been copied for the last fifty years from book to book by the compilers of works on medical history.

WARREN R. DAWSON.

LONDON, ENG.
April, 1930.

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CLIO MEDICA

THE BEGINNINGS: EGYPT & ASSYRIA

CHAPTER I

PRIMITIVE IDEAS OF DISEASE AND DEATH

Man's feeble race what ills await!
Labour, and Penury, the racks of Pain,
Disease, and Sorrow's weeping train,
And Death, sad refuge from the storms of fate!
Thomas Gray.

POETS and philosophers have for long ages pondered on the mysteries of death and their speculations have become more and more abstruse with the growth of human knowledge and learning: but primitive man was not an abstract thinker and long ages were destined to roll by before he had accumulated the concrete knowledge to convince him that death was the inevitable fate of all living creatures. Even at the present time there are peoples who believe that life should endure indefinitely and that the state we call death is merely an altered form of living, a break in the daily routine of existence, brought about by some agency, human or supernatural, that the wits of the living can and must counter-

act. A common concept regards death as an accidental liability that has not always existed, but was introduced on a particular occasion by revengeful gods, and individual death as the direct result of some malign power exerted by human or divine agency.

The Wachagga, for instance, a tribe inhabiting the Kilimanjaro district of Africa, have several traditions as to the origin of death. According to one of these stories, human mortality is the result of, and the punishment for, the disobedience of man in eating the fruit of a certain tree that the supreme god had forbidden, whilst the deity had given mankind the liberty to enjoy the fruits of all other kinds. Disobedience to divine commands resulted in the offenders and their descendants being doomed to die. According to another tradition, men were told by the messenger of the god that they would cast their skins when old and so renew their youth. A condition, however, was imposed that no eye should witness the act of sloughing. A certain old man, when his skin was partly cast, was imprudent enough to let himself be seen by his granddaughter, and as the result, mankind was denied the boon of renewed youthfulness for ever. Such beliefs as these are very widespread, and it is interesting to note that traditions almost identical with those we have just mentioned in Africa are widely diffused amongst the islands of Indonesia and Polynesia and elsewhere. Again, there are people in Australia and in South America who believe that if men did not die by violence, and were never bewitched, they would not die at all. An echo of the age-long desire of man to avert extinction and to renew his youth

is found in a magical text, written on the back of one of the Egyptian medical papyri, which is entitled "The Book for Transforming an Old Man into a Youth of Twenty."

To the mind of a primitive individual there can be no such state as death, because from observation it is found to be a fate which always befalls others and is never true of that individual himself; for when he dies he cannot contemplate his new state, which comes into being only when his consciousness has fled.

The accidents which cause death, by whatever name it may be called, and in whatever way it may be understood, are always menacingly at hand, however, and the interruption in the daily routine of active life which follows in their train has ever to be foreseen and guarded against. Hence arose the age-long quest of mankind for the Elixir of Life. In this striving after the preservation of youthful vigor man has made an endless series of compromises with fate to prolong his active existence by means of magic, by the use of amulets, and as a later development of these concepts, by medicine. Man has ever sought to repair by art the damage done to him by nature.

Violent death usually involves loss of blood, and hence it is probable that even as early as Aurignacian times blood came to be regarded as the vital fluid which was essential to active existence. This belief will explain why blood plays such an important part in the rites of primitive peoples, and why red objects have ever been associated with blood and with death. Primitive man sometimes buried his dead in red ochre, probably with the object of supplying the vital stuff that was

lacking in the inert corpse and was essential to restore it once more to activity. Red pebbles and other red objects were buried with the dead in order to add to the supply of the substance of life. In historic times the Egyptians used an amulet of red carnelian or red jasper that typified the blood of the goddess Isis, and its purpose was to stimulate for the dead the functions of the blood. The same association of red color with the dead may be seen in the custom that the Egyptians introduced at a relatively late period (about 1000 B.C.) of painting their mummies red or of investing them in red shrouds: the same custom has been followed in the case of mummies from the Canary Islands, from the islands of Torres Strait, from Australia, from South America and elsewhere.

The belief in the life-giving attributes of blood is evident in many customs that are still practiced in various parts of the world. Thus amongst certain Central Australian tribes in cases of severe illness human blood is swallowed as a medicine to impart renewed vitality to the patient: in such cases a man's blood is given to a woman, and a woman's to a man. Again, there exists the belief that a woman can cure her sick husband by rubbing his body with an ointment made of a mixture of fat and red ochre, the red ochre here, as elsewhere, being a substitute for blood. A paste of fat and red clay was rubbed on their bodies by Kaffir women as a "purification" after childbirth, and the Incas of Peru used to rub upon their bodies a paste of blood as a protection against disease and weakness.

Evidently the same motive accounts for the frequent use of red haematite, ground fine,

as one of the ingredients in many of the prescriptions in the Egyptian medical papyri. It was introduced as a coloring agent into mixtures in which fatty or greasy substances were the essential elements. In Tasmania human blood was given to the sick to drink, and the Beni-Amer of East Africa wash themselves in the blood of a girl or of an animal. The vitalizing power of blood is also the reason for its use for smearing the bodies of youths during the initiation ceremonies in many places. The blood drawn during the rite of circumcision and the menstrual blood of women is often credited with special powers of life-giving because it originates in the life-giving organs. According to a myth preserved in the Egyptian "Book of the Dead," the sun-god Re mutilated himself, and the gods Hu and Sia sprang into existence from the blood which fell from his virile member. This was probably the motive that originally was responsible for the invention of circumcision.

Amongst many peoples today sacred trees are often sprinkled with blood in order to convey fertility and protection to them, and there are many myths which ascribe the origin of trees and plants to blood. In the well-known Egyptian tale called "The Story of the Two Brothers," two great acacia trees miraculously sprang from two drops of blood which fell from the neck of the slaughtered bull, who was the reincarnation of Bati, the hero of the story. According to another myth, blood fell from the nose of the god Geb: "the blood grew: and thus came into existence the cedar tree, and from its sap came cedar-oil." The growth of plants from the blood of Attis,

Adonis and Hyacinth are familiar classical parallels.

Violent death, caused by visible and material agency, such as the foeman's axe or the fangs of wild beasts, is regarded today amongst some peoples in quite a different light from death resulting from disease. The primitive mind in such cases refuses to see in death any connection with the sickness which preceded it, or in any sense the natural consequence or termination of illness. The belief is almost universal that sickness and death are unnatural and abnormal, and that they are the manifestations of mischief caused by malign influence, human or divine. Sickness is the result of one such act of malignity, and death, if it follows, results from another and quite separate act, not necessarily emanating from the same source. In Queensland, for instance, it is believed that sickness is caused by some supernatural power, and in South Australia that it is the work of an enemy. Elsewhere we find sickness attributed to a god, or to the spirits of the dead, and the same ideas are expressed in a phrase that often occurs in Egyptian magical and medical texts which contain directions for ridding a patient of suffering, called "the assaults of a god, the assaults of a goddess, of a dead man or of a dead woman, of an enemy male or female, of an adversary male or female." The refusal to admit death from sickness or from natural causes is very widespread. It is a common belief in Africa, it is found in the Andaman Islands and throughout Indonesia and Melanesia and in many other parts of the world. Thus the connection between sickness and death is widely

denied, and also death from any other cause than battle, murder, or the attacks of wild beasts. Even the latter are often thought to be merely the agents of the sorcerer. What we call natural death is nearly always attributed to witchcraft, sorcery, or divine interference in human affairs. Such are the prevailing ideas among primitive peoples today, and, by analogy, such was probably the belief of primitive man.

But if sickness did not cause death, death was believed to cause sickness. We have already noted the Egyptian phrase which voices the idea that sickness and disease can be caused by "the assaults of a dead man or of a dead woman." A similar belief in the danger of the dead to the living is found in many parts of the world. In Cambodia, for instance, the dead are carried from their houses for burial feet foremost: this is done in order that the dead man may not see the house, in which event sickness would visit the survivors. For the same reason in other places fires are lighted around houses in which a dead body lies in order to keep out evil spirits which are attracted by the corpse and would bring sickness upon the living. These and similar customs imply a belief in something very like contagion from the dead, and to protect himself against such risks the ingenuity of man has devised many measures. Thus the Navajos, when burying their dead, smear their bodies with tar in order to protect themselves from evil influences. This contagion is a spiritual and not a physical one; there is, of course, no idea of physical morbid infection by touching a dead body that had died of disease. The real fear was that the evil spirits

residing in the corpse could transfer themselves or their influence to the living by mere contact. This belief underlies a host of customs and superstitions connected with the dead, and persons whose duties bring them into direct contact with dead bodies are always feared and avoided. It is thus that embalmers and other persons connected with mummifying the dead tend to become segregated into a separate caste. We see this motive clearly in the statement of Diodorus Siculus that the man who made the flank incision in the body of an Egyptian during the process of mummification was obliged to take to his heels as soon as his duty had been performed, when he was pursued by all who had witnessed the act and pelted with stones and with curses. An exact parallel can be quoted from Torres Straits, where the man whose duty it was to cut off the head of a corpse for the purpose of embalming it was obliged to flee from the relatives of the dead who shot a shower of arrows at him. Similarly in Tahiti, the embalmers were carefully avoided and were not even allowed to feed themselves: for if they handled food, all other food was liable to be affected by the taint of death, on the principle of sympathetic magic, by the contagion of the corpse the embalmers had touched. The original hatred or avoidance of those who ceremonially mutilated the dead during the course of embalming was not due to respect or reverence for the dead, but to the fear that the influence of the corpse might harm the living.

Such notions as we have just described gave rise to the necessity of exercising ingenuity in order to foil, or occasionally to appease, the powers

which inflicted illness or death and to avenge their victims. The need was also felt of securing continuity of existence in spite of all attempts, human or divine, to cause its extinction. Around this determination has grown the vast edifice of diverse customs and beliefs, of religions and philosophies, of ceremonies and rituals, many of which betray their common origin. It was out of this determination to thwart hostile powers that the rôles of the magician, of the doctor, and to a large extent also of the priest, came into being. Amulets were worn by the living and buried with the dead to protect and prolong life, to confer vitality and to impede the powers of evil. Shells, perhaps the earliest symbols of life, played an obtrusive part in protective magic: they were worn by the living to facilitate birth and were bestowed on the dead to ensure rebirth.

The elaborate and widespread system of beliefs in immortality and a future life arose out of the attempts of early man to prolong life, and these endeavours took definite shape in Egypt where the art was learned not only of preventing the dissolution of the body but of preserving the form and personal identity of the dead. The circumstances which gave rise to the art of mummification we shall consider in the next chapter. This strange and distinctive custom has played an enormous part not only in religious history, but in shaping the destinies of mankind: ethnologists as yet have scarcely begun to recognize how great this influence has been, or the extent to which its manifold ramifications can be traced and discerned.

CHAPTER II

AVERTING DEATH AND PROLONGING LIFE

So when this corruptible shall have put on incorruption, and this mortal shall have put on immortality, then shall be brought to pass the saying that is written, Death is swallowed up in victory. I. Corinthians, xv, 54.

In tracing the history of medicine we must naturally base our researches upon the oldest materials we have, and consequently Egyptian medicine is the foundation upon which the structure of a great science has been erected, because it antedates the earliest medical records of other countries by many centuries.

The date of the beginning of the First Dynasty of Egypt is usually accepted as about the year 3400 B.C. In the long period of advancing civilization that preceded this inauguration of the historic era it was customary to bury the dead by inhumation in the sands of the desert. Cultivable land was too valuable to sacrifice to such a purpose, and indeed, had it been the custom to bury the dead in the moist loamy soil adjoining the river, we should have no knowledge of the early civilization of the Nile Valley, for all its records must inevitably have decayed. By burying their dead in the hot dry desert sands, the predynastic Egyptians confided to nature not only the actual bodies of their dead, but all the equipment with which they provided them, and the preservation of these relics has enabled us to reconstruct the life and culture of that far distant

age. The dead were buried in a flexed position in shallow graves and completely covered with sand. The result of this method has been, wherever circumstances were favorable, the entire preservation of the corpse by desiccation. Thanks to the dry climate and the preservative effect of direct contact with the sand, so perfectly has nature conserved the remains of these early dwellers in the Nile Valley, that it is possible to examine anatomically the soft and perishable parts of the body, and even to ascertain the nature of the food they ate. From the stomachs and intestines of these prehistoric people it has been possible to recover large quantities of food-materials, in fact the last meals eaten before death. The scientific examination of these specimens has also disclosed some of the methods they used to prepare their food for consumption. Husks of barley were identified in almost every specimen, and in a number of cases those of millet were also found. The finding of millet is of great interest because its use in Egypt has been denied, and the species found is not now cultivated except in the East Indies. Root-tubers and the remains of other plants were found, also abundant traces of fish, for the predynastic Egyptians made and used metal fish-hooks. These points are worth mentioning as they show how much the natural conditions of Egypt have aided modern research in investigating early civilization: nowhere else in the world are circumstances so favorable.

There are good reasons for believing that this wonderful phenomenon of natural preservation in Egypt suggested the earliest attempts to pre-

serve the body by artificial means, in other words to make mummies, a custom which had reached a high stage of development by the time the Pyramids were built. It is highly probable that attempts at mummification were being made, at least in the case of royal personages, during the First Dynasty. This is suggested by the fact that a human arm, adorned with bracelets and wrapped in linen bandages, was found in a royal tomb of the First Dynasty at Abydos. The earliest definite evidence of an attempt at mummification is afforded by a body of the Second Dynasty discovered some years ago at Sakkara, and by the time of the Fifth Dynasty (*ca.* 2700 B.C.) mummification had reached a high state of efficiency. The mummy discovered by Sir Flinders Petrie at Meidûm, and now in the Museum of the Royal College of Surgeons in London, shows that considerable advances had been made in the embalmer's craft. The flexed position in which the predynastic bodies are found was retained in the earliest mummies, but the Meidûm mummy is in the fully extended attitude. After the application of many layers of fine linen bandage, the mummy was covered in resin which has set to form a hard carapace. The details of the features are indicated by paint on the outermost wrappings, and the genital organs were modelled with linen and resin. These methods of treatment had a definite purpose to serve; they were carried out in order that the sex and personal likeness of the dead man might be perpetuated. From the custom of painting the features on the wrappings of the mummy developed the employment of masks made of carton-

nage: these masks in turn were succeeded by the use of anthropoid coffins with wooden masks, and finally, in Roman times, by portrait-panels depicting the features and appearance of the dead man, his real face being concealed from view beneath the voluminous layers of linen bandages.

During the period of the Middle Kingdom (*ca.* 2000 B.C.) the embalmer's art deteriorated somewhat, and the mummies of that period are usually ill-preserved and very fragile, but from the beginning of the Eighteenth Dynasty great progress was made. New methods of procedure were introduced, which were improved from time to time, until under the Twenty-first Dynasty the most successful mummies were prepared. By this time not only had the embalmers succeeded in preserving the tissues of the body perfectly, but they introduced an elaborate system of packing material under the skin so as to plump out the shrunken corpse into the fullness of contour of a living person. They enhanced the effect by inserting artificial eyes, and by painting the whole body with red ochre. After this period the art of mummification tended to deteriorate: less care was taken with the treatment of the body itself, and more attention was paid to the arrangement of the superficial wrappings so as to give the mummy a finished and presentable exterior. The custom however was fully maintained, and whether of good workmanship or bad, mummies have been found of all periods of Egyptian history. The practice of embalming resisted all foreign influence, survived the Persian, Greek and Roman dominations

and persisted for several centuries into the Christian era. Thus the practice of mummification continued in Egypt for more than thirty centuries, and was imitated in many other parts of the world.

The well-known accounts of Egyptian embalming given by Herodotus and Diodorus Siculus, while seriously wrong in certain details, are confirmed in the main by the examination of actual mummies. The complex process underwent many changes in the course of its enormously long history, but it was the custom from very early times to remove the viscera through an incision in the left flank, care being taken to leave the heart untouched. The body was immersed in a saline solution for a long period (but not seventy days as stated by Herodotus, which was the time occupied by the *whole* process) and was then desiccated and anointed with a paste made of resin mixed with salt, soda and fat. Herodotus tells us that the brain was removed through the nostrils, and this statement is quite correct in the cases of mummies of the Eighteenth and following dynasties. It is not true of earlier periods, however, for there is no evidence of any attempt to remove the brain in mummies anterior to the Eighteenth Dynasty.

In considering possible origins of the process of mummification one turns to the belief that death was not the end of life, which has prompted man from the earliest times to bury with the dead, not only amulets for protection, but objects necessary to life: food, pottery, tools, weapons and a host of other articles, which it was believed the dead would still require in a purely physical

sense. With the advance of civilization in Egypt, this burial equipment became more and more elaborate, and it soon became impossible to accommodate it in a small grave scooped in the sand. This elaboration of the funerary gear was the outcome of the conviction that the body in the grave remained intact and did not suffer corruption, and thus began the custom, which developed enormously in later periods, of constructing chambered tombs for the accommodation of the dead man and his multifarious belongings. But the burial of the dead in these roomy chambers, in which the corpse was exposed to moisture and to the action of the air because it was no longer embedded in desiccating sand, defeated the very object that had inspired the more lavish equipment. For the body decayed, and the dead man no longer survived to enjoy the use of the objects with which he was surrounded. By this means, the idea of preventing the corruption of the body took a firm hold as being the essential factor in securing the continuance of existence. Consequently the Egyptians set to work to discover a means whereby they might achieve by art what nature alone had accomplished in the simpler sand burials and had failed to accomplish in chambered tombs.

Thus arose the art of mummification, the development of which we have briefly sketched here, a custom which has had a profound effect upon the civilization of the world. The practice, moreover, has had great influence in the history of medicine, for not only did it familiarize its users with much of the internal structure of the body and with the preservative properties of the salts

and resins employed in the process, but its long continuance was an important means by which the prejudice against cutting the human body was overcome, and which made systematic dissection possible. It was in Egypt that the Greek physicians first carried out systematic dissection of the human body and thereby laid the foundations of the science of anatomy.

Mummification, whilst playing so important a part in the development of medical science, was however a religious observance, and its practice was not carried out by physicians. It became the essential feature of the religious and philosophical edifice that grew up about it, and which has persisted throughout the ages in varying forms, since first it seemed to offer to men the means of averting extinction and of obtaining continuity of existence. Throughout its long career, the art of embalming was inspired by two aims which were never lost sight of: the preservation of the body from decay and the perpetuation of the personal identity of the individual. The mummy was not completely equipped when, duly preserved and bandaged, it left the embalmers' hands; it had then to undergo another process. This was accomplished by a long series of ceremonies generally called "the opening of the mouth." These ceremonies, which were magical in character, had for their object the restoration to the inert corpse of the faculties of which it had been temporarily deprived by death and embalming. By means of recited formulae accompanied by magic passes, the officiating priests opened the eyes, the mouth and the ears of the mummy in order that the dead man might see, speak, eat and hear. By

similar means the use of his limbs and of all his faculties was restored, and a ceremonial banquet was then provided. The Egyptians envisaged their dead as still physically living, and provided physical food for their needs. The frequent statement that the funerary ceremonies transformed the offerings into spiritual food for the dead man's spirit is erroneous: there was nothing spiritual in these ceremonies, the dormant mummy was reanimated in a physical sense, and the warmth and moisture which the body had lost during the process of embalming were restored to it by the ceremonial burning of incense and by pouring out libations.

These procedures all echo, each in its own way, the refusal to regard death as an end of life or even as a reality. The earliest literature of Egypt, the "Pyramid Texts," so-called because the fullest and oldest copies we possess were inscribed on the walls of the chambers in the pyramids of the Pharaohs of the Fifth and Sixth Dynasties, is full of protests against the idea of death. We often meet with such expressions as "this King dies not"; "have ye said that he would die? He dieth not"; "this King liveth forever." Throughout Egyptian history, the mention of a king's name is almost invariably followed by the words "endowed, like Re, with life forever." There is abundant proof in Egypt, that the dead were envisaged as still living and as early as the Pyramid Age, and probably earlier, the tombs were inscribed with texts the object of which was to provide by magical means food offerings for physical consumption, and protection against such earthly foes as scorpions and snakes.

As has already been indicated, the complex art of mummification was progressive. The age-long practice of plundering tombs for the treasures buried in them exposed the hapless bodies of the dead and revealed to the embalmers from age to age the imperfections in the craft of their predecessors and thus stimulated them to introduce new measures in order to accomplish their object with greater permanence and success. In ancient times, as now, man learned by his mistakes. In all his mental activities, as well as in his practical achievements, man has groped his way step by step, slowly and painfully, from darkness into light, often led astray by spectres and by will-o-the-wisps, but by dogged perseverance the appointed goal is reached.

CHAPTER III

THE MAGICIAN

Come forth, thou unclean spirit, out of the man.
Mark, v, 8.

Death was not the only accident that befell unwary men: illness and disease had also to be reckoned with, and as their cause was impalpable and invisible, it was accordingly laid at the door of supernatural influence. Today the belief is widespread that illness is caused by sorcery, witchcraft or by evil spirits. Every healthy man was ever liable to fall a prey to such malignant powers, and elaborate measures were adopted to protect the living from possession just as they were to protect the dead from extinction.

The present-day belief in possession as a cause of illness amongst primitive peoples echoes, as has already been noted, the same belief in antiquity that is clearly expressed in the earliest magical and medical literature that has survived, the Egyptian medical texts, of which some account will be given in a later chapter.

There cannot be the slightest doubt that medicine had its origin in magic, and that for many centuries, almost to the present day in fact, magic has never completely lost its hold on medicine. The earliest doctors accordingly were magicians, and the earliest forms of medical treatment were magical rites. From the earliest times there have been persons who claim to have powers over nature and over the unseen which their fellows do not possess. The intimate con-

nection between magic and religion is clearly shown in the fact that the first magicians of whom we have any record were priests, and throughout Egyptian history many of the functions of the priesthood were magical in character. The magician's functions were numerous: in addition to his religious duties he was called into request by many contingences, and sometimes he appears as a wonder-worker, performing prodigies for the amusement of the king and his court.

A document now in the Berlin Museum, known as the Westcar Papyrus, contains a series of popular stories of the wonders worked by magicians for the entertainment of the Pharaohs of the Pyramid Age. In these narratives we are told of a magician who fashioned a miniature crocodile of wax over which he recited magical spells and transformed it into a full-sized live crocodile, which seized a guilty man. In another episode, the magician parted the waters of a lake in order to recover from its bed a jewel which had been dropped from a boat into the water. King Cheops, the builder of the Great Pyramid of Gizeh, was entertained by the prodigies worked by a magician named Dedi. This Dedi was a most remarkable person, for the papyrus says of him:

> There is a man of humble birth, and Dedi is his name. He is a man of humble birth 110 years old, yet he can eat five hundred loaves of bread, a haunch of beef as meat, and can drink a hundred jugs of beer at this very day.

The king, on hearing this, was anxious to see Dedi, and he sent his son to escort the old man to the palace. The prince found the magician enjoying a siesta outside his door:

He found him lying on a couch at the door of his house, a servant was stroking his head for him, and another was tickling the soles of his feet.

The prince took the magician to the court, where he was greeted by the King, who said:

"Is it true, as it is alleged, that thou canst put on a head that has been cut off?"

When Dedi answered in the affirmative, the King ordered a prisoner to be brought in and beheaded in order that Dedi might give proof of his powers. Dedi, however, refused to experiment upon a human subject, and asked for a goose. A goose was accordingly brought in and its head chopped off:

And the goose was put on the left side of the chamber, and its head on the right side of the chamber. And Dedi recited his magic spells, at which the goose arose and moved, and its head also. Now when the one had reached the other, the goose stood up and quacked.

Similar experiments were performed with a duck and with an ox.

It is however as a healer of disease that we most often meet with the magician. We know how he operated in such cases, for a large number of magical papyri has been found in Egypt, in which are set out at length the spells and incantations that the magician uttered, and minute directions as to how he was to proceed in various cases. In these papyri, diseases and illnesses are treated as if personified, and addressed. The idea of possession is manifest in all cases of sickness, for usually the spirit itself is addressed by the magician, or else the poison

or other evil influence which it was believed to have projected into the body of the patient.

The simplest method of treatment was the recitation of a spell in which the demon was bidden to be gone, or the poison to leave the patient's body. Such spells are usually full of references to the gods, and the defeat of the demon is usually attributed to divine power. The magician usually addressed the possessing spirit with such words as "Get thee back thou enemy, thou dead man or thou dead woman who dost cause pain to N the son of M," or, "flow out, thou poison, upon the ground." He often assumes the rôle of Horus or some other god: "Horus conjures thee, he cuts thee off." The spirit is usually defeated by an assurance from the magician that it is really powerless: "Thou art weak and art not strong, a coward and dost not fight, blind and dost not see," or "Thy head has no power over his [the patient's] head, thy arms have no power over his arms. No limbs of thine have power over any limbs of his." By thus informing the spirit of its impotence to harm the patient the magician, by sympathetic magic, imagines he is depriving the demon of its potency. In other spells the spirit is rendered powerless by the mere invocation of the name of a god: "Thou fleest from the magician, from the servant of Horus, when he utters the name of Horus, when he utters the name Seth."

Treatment of this kind was effected by word of mouth only. In most spells, however, the spoken word is accompanied by gestures, or by the use of figures, amulets, or other substances which the magician charges with occult power. These two

phases of the magician's art have been aptly defined by Dr. Alan Gardiner as the *oral rite* and the *manual rite* respectively. It is usual, in the magical texts, to find a rubric at the end of the oral rite giving directions as to the accompanying manual rite: "Say the words four times over a cord in which seven knots have been tied," is a typical rubric of this kind, and many variant forms of it occur. Thus at the end of a spell to assuage the pains of labor and to facilitate birth is the rubric: "Say the words four times over a dwarf of clay to be laid upon the top of the head of the woman who is giving birth."

Often the manual rite took the form of giving the patient mixtures of various substances to eat or drink. The dose so given was rendered efficacious by reciting over it a spell or incantation. The Ebers Papyrus, for instance, begins with a long incantation which is presumably intended to give efficacy to the numerous prescriptions which follow. In the present writer's opinion, the prescriptions in the medical papyri are but elaborations of the manual rite, and it is for this reason that the papyri are interspersed with magical spells which are the oral rites belonging to each group that follows and which are recited by the magician in order to make the medicines effective. Many of the doses contain foul or offensive substances, and the object of them is obviously to be as unpalatable as possible to the possessing spirit, so as to give it no encouragement to linger in the patient's body. But even wholesome drugs could be offensive to the spirits. Thus in one of the spells it is said, "I make a spell against thee with the *Efai*-plant which injures;

with onions which destroy thee; and with honey which is sweet to the living and bitter to the dead." In this case it is the spirit of a dead man which threatens the patient.

It is characteristic of the magician in all places and at all times that he should have more than one string to his bow, for if one method fails, another may succeed, and his reputation must at all costs be maintained. Consequently we find in the medical papyri numerous alternative prescriptions, and in the magical texts, alternative spells, provided for every kind of sickness or calamity. Some of these contain drugs which are really beneficial and appropriate, and such prescriptions would tend to survive the more fantastic ones. By this means, more and more reliance came to be placed upon the drugs themselves and less and less upon the magician's spells, and the persons therefore who were in request in cases of sickness were those who were skilled in the knowledge and preparation of drugs. These men were no longer magicians, but physicians.

It must not be supposed that the coming of the physician extinguished the magic art. It is rare in human experience for the new completely to supersede the old: the one existed, and continued for many centuries to exist, side by side with the other. Just as the first steamships were provided with auxiliary sails, so the first physicians kept magic as a reserve force to be used in case of need. Medicine branched off from magic and began its independent career early in Egyptian history, for in the distant Pyramid Age we find mention of men bearing the title of physician as distinct from magician. But even the physicians

were closely associated with magic and religious ritual, and religious elements continued to pervade medicine. The religious element is evident in the fact that the Egyptians associated every part of the body with a god or a goddess, just as in the Dark Ages the members of the body were placed under the protection of the Signs of the Zodiac. We have lists of the bodily organs, both external and internal, with the names of the divinities to whose protection each was ascribed. Such lists occur in all periods from the Pyramid Texts of the Fifth and Sixth Dynasties until the end of Egyptian independence in the Thirtieth, and the tradition was maintained under the Greek dynasty of Ptolemaic kings that followed. In the "Book of the Dead," in the long texts inscribed on the wooden coffins of the Middle Kingdom, in the magical papyri of the New Kingdom as exemplified by those in the museums of Leiden, Turin and Rome, in the inscriptions engraved upon the walls of the tombs of the kings at Thebes, on the great Metternich Stele of the Thirtieth Dynasty and elsewhere such lists are found. In a papyrus in Berlin which contains spells and prescriptions for the protection of mothers and infants there are two lists, one containing thirty-six and the other twenty-three different organs or parts of the body. Such lists usually end with the phrase "there is no part of the body without its god." The religious element again appears in a series of prescriptions in the Ebers and Hearst papyri, each of which is claimed to have been invented by a god. Thus we have "a prescription which Re made on his own behalf," "a second prescription which Shu made in his own behalf,"

"a third prescription which Tefnut made on behalf of Re," and so on.

In a later chapter Egyptian medicine as apart from magic will be examined, but concerning the latter a few more words may be said. It has already been pointed out what a close relationship existed between magic and medicine, and in this connection it may be noted that Dr. Alan Gardiner has admirably summarized this relationship when he said "medical books are seldom free from incantations, and the magical papyri are interspersed with medical prescriptions."

Apart from diseases and evil spirits which were treated as personified by the magicians, magic itself was sometimes believed to be the cause of illness. One of the prescriptions in the Ebers Papyrus is headed "to banish magic from the body." Other ailments, as we have already noted, were laid to the charge of a god or an enemy or a dead man or woman. Spirits of foreign origin were especially to be feared, and we find prescriptions for expelling the influence of a negress, or of an "Asiatic woman who steals in secretly in the dark." The possessing spirit either resided in the body of the patient, or else injected some poison or other harmful influence. Once installed, the spirits made the patient ill, and they had to be speedily ejected. This was accomplished by the spells which we have already referred to, or by administering a medicine to the patient, or by both methods combined. The spirit then left the patient's body in various ways: either it passed out with his sweat, urine or other secretions, or it was ejected in the form of wind. In the medical papyri each prescription

is headed by a title, and instead of the simple phrase "prescription for curing such and such a disease," we have "prescription for banishing," "driving out," "terrifying" or "killing" the disease. In such phraseology the notion of possession is manifest. Some of the prescriptions, however, are for "treating" a disease: these must be regarded as later in origin than the others, and represent the period when the manual rite was superseding in importance the oral rite, that is to say when rational therapeutics began to take the place of pure magic. The notion of possession is never entirely absent, however, and even when treating a disease by rational therapeutic methods, the physician could never forget that his craft originated in various attempts to coax, charm, or forcibly expel the disease-causing spirit from its involuntary host. Indeed many of the drugs in the medical paypri, even when wholesome and rational, originally found their way into the pharmacopoeia for purely magical reasons. Even diseases which have obvious external manifestations, such as sores, boils or swellings, were believed to be caused by possessing spirits. At first wounds alone, because inflicted by human agency, and therefore material and comprehensible, were treated by rational and practical means; and the analogies in the morbid conditions often associated with or resulting from wounds, such as suppuration, swellings, and other manifestations, led the physicians and surgeons to apply the same rational methods of treatment to morbid conditions arising from disease.

It does not in the least prejudice the view here expressed (that possession was originally believed

to be the cause of illness) that many of the prescriptions in the medical papyri are for the treatment of disease in various named organs of the body. This fact merely shows that in many cases the Egyptians were able to localize a disease, but it does not remove the belief that a spirit was the cause of the trouble. Demons fear amulets, and for this reason knotted cords, images or other objects were often tied on to the affected part. Sometimes however they are merely hung round the neck, and in one case, an incantation for curing headache, the cord is tied to the patient's big toe. The knotted cords to which we have already referred (usually having *seven* knots in them), were very frequently used, not only in Egypt, but in many other places. The knots were evidently believed to be magical barriers which impeded the passage of malign influences into the body. In one of the Turin papyri, there is an utterance which clearly illustrates this idea: "If the poison shall pass through these seven knots which Horus has placed upon his body, I will not suffer the sun to shine."

The latter part of this expression illustrates another feature of these magical spells. The magician frequently uses threats and claims a power over the elements. Thus he will threaten to suspend the forces of nature, if a demon disobeys his command to begone. "Re waits for thee [to depart] that he may shine, and Atum that he may set." The threats at times become very daring, and are directed against the gods themselves. In a spell against scorpion stings, the magician threatens to stop the flow of the Nile,

the light of the sun and the growth of seeds, if Selkis, the scorpion goddess, dares to sting his patient. In another place he even threatens to burn up Osiris! In the Pyramid Texts of the Fifth and Sixth Dynasties dire threats are uttered against the gods by the king who is addressing them.

If the magician's menaces became too daring, he makes the gods his scapegoats and disclaims responsibility for his words, for after several spells in which the magician has overstepped the bounds of prudence in his threats, such words as these are added: "It is not I who say it, it is not I who repeat it: it is Isis who says it, it is Isis who repeats it." By the frequent habit of impersonating the gods, the magician also claimed indemnity against the results of his utterances. Many spells begin with the words "I am Re," "I am Horus," etc.

A method of destroying hostile powers which was practiced in ancient Egypt, and which is widespread at the present day, is to make wax effigies of the demons or to draw pictures of them. The effigies or pictures were then burnt and by sympathetic magic the demons were believed to be consumed by the flames. Sickness, disease and poison were treated by the magician as personified, and other influences were dealt with in the same way. Thus we find spells for inducing dreams, or for banishing terror and fear. There is a spell in one of the Leiden papyri containing an incantation which is called "the book for repelling Fear which steals upon a man in the darkness from before or from behind." Burns were treated by means of incantations, as were also the stings

of scorpions. In Egypt, as elsewhere, is found belief in the malevolent power of the Evil Eye.

We must now leave the magician and his spells and trace the development of the healing art when it begins to outgrow its magical childhood and to emerge into the daylight of rationalism.

Old superstitions die hard: throughout human history the pioneers of a new faith or of a new science have had to contend, not only with the innate conservatism of the mind, but with the wiles of those whose craft is threatened by the coming of a new doctrine. Southey has truly said:

> Man is a dupeable animal. Quacks in medicine, quacks in religion and quacks in politics know this, and act upon that knowledge. There is scarcely any one who may not, like a trout, be taken by tickling.

CHAPTER IV

THE FIRST MEDICAL BOOKS

Well, whatever bit of a wise man's work is honestly and benevolently done, that bit is his book or his piece of art. It is mixed always with evil fragments—ill-done, redundant, affected work. But if you read rightly, you will easily discover the true bits, and those *are* the book.
John Ruskin.

In discussing the art of the magician, it was noted that his *modus operandi* was chiefly the use of oral and manual rites. It was the development of the manual rite that first called the physician into existence. For when this rite took the form, either for the sufferer's comfort or the possessing spirit's discomfort, of administering to the patient substances to swallow, the first medical prescriptions were given. It was by rationalizing these prescriptions and by the tendency to use more and more only substances that really had a beneficial effect upon the sufferer, that therapeutics began. As the doses became more efficient, so naturally faith in the supremacy of the oral rite tended to decline, and a type of magician was demanded who would specialize in the treatment of sickness by efficient manual rites: such were the first doctors. Attention has already been called to the fact that both death and wounds, inflicted by living human mortals, are regarded by primitive peoples in quite a different light from death or injury arising out of sickness. This same distinction is manifest in the Egyptian medical papyri, where we find wounds dealt with by rational methods, and not

left to the mercy of the magician and his spells. The Edwin Smith Papyrus describes the treatment of wounds, but it also contains glosses or comments upon the nature of the wounds and the organs affected by them, and accordingly to this document is accorded the honor of being the earliest known scientific book. It thus differs entirely from the other medical papyri which do not, except in rare instances, deal with diagnosis or symptoms; and it discusses these features in a manner which shows that its compiler was attempting to record and classify systematic observations on the anatomy and physiology of the human body. We shall revert to this papyrus in a later chapter.

To summarize the beginnings of medical science concisely it might be said that disease or injury by act of god (including spirits, etc.) was regarded as supernatural and treated by magical means, whilst injuries inflicted by man were regarded rationally and treated accordingly. In other words medicine began in the attempt to repair injuries and sufferings of divine origin, and surgery in the attempt to repair the ravages of man.

These points will become clearer in the next chapter in which we shall describe in more detail the nature and extent of medical knowledge in ancient Egypt. In the meantime we must glance over the documents from which our knowledge of Egyptian medicine is derived. These earliest medical books are a series of manuscripts written in the cursive form of hieroglyphic writing usually called *hieratic*, and are as follows:

1. The Ebers Papyrus is the longest and most famous of these documents. It was found in a

tomb at Thebes together with the Edwin Smith Papyrus about 1862, and was acquired by the Egyptologist whose name it bears. It is now preserved in the University of Leipsic, and is in almost perfect condition. On the back of the document is written a calendar which has been of the utmost importance in the difficult question of Egyptian chronology. The Ebers Papyrus was written about 1500 B.C., but there is abundant evidence on philological and other grounds, that it was copied from a series of books many centuries older. It is stated in the papyrus itself that one passage dates from the First Dynasty (*ca.* 3400 B.C.) and another prescription is associated with a queen of the Sixth Dynasty. Such statements as these are of no positive value in dating, because it was in Egypt, as elsewhere, a common literary artifice to ascribe to books a very ancient origin in order to enhance their value and authority. Fortunately, however, we do not rely on such statements for dating Egyptian documents. Our knowledge of the writing, grammar and palaeography of the papyri enables us to place them fairly accurately. Probably the books from which the Ebers Papyrus contains excerpts were written during the Twelfth or Thirteenth Dynasties, although their subject-matter might then have been many centuries older.

The Ebers Papyrus consists of a long series of prescriptions for numerous named ailments and diseases, specifying the drugs to be used, the quantities of each, and the methods of administering them. Certain sections deal not only with the treatment, but with symptoms and diagnosis of various complaints, and many passages have

explanatory glosses or comments. The papyrus in its present state is an assemblage of extracts from a number of separate works, each dealing with a special subject, and the text is interspersed with incantations. The text covers 110 large columns in the original roll, which a modern editor has conveniently divided into 877 numbered prescriptions and sections.

2. The Hearst Papyrus was discovered in 1899 by a native near Deir el-Ballas in Upper Egypt. In 1901 he brought it, tied up in a head-cloth, to Dr. Reisner who was then excavating in the district. By him it was acquired for the University of California where it is now preserved. Owing to its having been tied up in the finder's head-cloth, the roll has been damaged on its outermost folds, and three columns of the writing reduced to fragments. Otherwise, however, it is in excellent condition and consists of fifteen closely written columns of writing. The document dates from about the same period as the Ebers Papyrus, and its contents are very similar, in fact some parts of it are actually duplicated in the Ebers Papyrus. It contains 260 sections.

3. The Berlin Medical Papyrus is of somewhat later date than the Ebers and Hearst manuscripts, but like them, it betrays its more ancient origin. The text is carelessly written and is very corrupt. It contains 204 sections, including a passage written on the back of the roll which deals with methods of ascertaining sterility and the sex of unborn children.

4. The Kahun Medical Papyrus was discovered by Sir Flinders Petrie in 1889 when excavating in the Fayûm. It is older in date than any of the

preceding and must be assigned to the period of the Twelfth or Thirteenth Dynasties (*ca.* 2000–1800 B.C.). Although in fragmentary condition, the greater part of its contents is legible, and it deals with one subject only, gynecology. It contains 34 sections.

5. Mention has already been made of the Edwin Smith Papyrus, a most important document which deals with wounds.

6. Other Documents. The London Medical Papyrus, now in the British Museum, is similar in nature to the others, although it contains a larger proportion of purely magical matter, and in this respect it is similar to the papyri of Leiden and Turin. It was written in the Nineteenth Dynasty, although its ultimate origin is probably much older. A veterinary papyrus dealing with diseases of animals was found at Illahun, and a series of magical papyri, scattered in various museums, notably those of Leiden and Turin, afford many interesting details. They are medical in so far as their purpose is the cure of disease, but their object is achieved more by the use of incantations than by prescriptions of drugs. We have also referred to a papyrus at Berlin which contains a collection of spells and prescriptions for mothers and newborn infants, and to another document in the same collection, the Westcar Papyrus, which although not concerned with medicine at all, being a collection of popular stories, describes in graphic detail the birth of triplets, affording much interesting information on the Egyptian methods of accouchement. As an additional source of information concerning Egyptian medicine, we

have to draw upon such relevant facts as can be gleaned from the sculptures, tomb scenes and religious texts, and from the antiquities preserved in various museums.

The miscellaneous nature of the contents of the medical papyri (1–4) already mentioned suggests that they are copies, made for the use of general practitioners who lived in places where the libraries of the temples were inaccessible to them. Herodotus' statement that all the physicians in Egypt were specialists is only partly true: the fact that the medical papyri are made up of excerpts from different books, each dealing with an individual branch of medicine (i.e. the work of a specialist) indicates clearly that they are intended for general practitioners who had to be prepared to deal with cases of every possible kind.

In addition to the papyri already mentioned, most of which date from the New Kingdom (Eighteenth to Twentieth Dynasties), it may be mentioned that there are medical and magical books in existence which belong to much later periods. Of these the most famous is the London-Leiden Magical Papyrus, part of which is in the British Museum and part in the museum of Leiden. This document, written in the third century A.D., shows that the belief in magic was then as strong as it had been many centuries earlier. Finally, reference may be made to a long and interesting medical papyrus written in Coptic, the language of the Christian Egyptians, of the ninth or tenth century. This document is entirely purged of magic, but its arrangement and contents betray its ancient origin, for it is very similar to the medical books written in

the time of the Pharaohs. The groundwork is identical, and it only differs in the fact that many drugs of Greek and Arabic origin had been added to the pharmacopoeia. This important papyrus was discovered in 1892 at Meshaikh, near the ancient Lepidotonpolis, in Egypt, and is about two-and-a-half meters in length. It contains 237 prescriptions, a large number of which deal with complaints of the eyes. Spells and incantations are entirely absent from this text, although they occur in other Coptic medical writings. The patient has generally to rely on the treatment prescribed by the physician without magical or divine aid: to a very few prescriptions the words are added "he will be cured, if it please God," or "he will recover by the power of God." The author was discriminating in his choice of the prescriptions he wrote down from the various traditional sources from which he must have gathered them. One or two of them appear to be original; for instance, one of his remedies he calls "a great remedy on which I have worked myself, with my father," and of another he says "a good collyrium on which I have worked with my father, great is its virtue." There is one prescription which is a comprehensive remedy for diseases of the spleen, for a crooked body or limbs, for calculi, and is also an emmenagogue, and of this the author says it is a remedy "which we found written in the books of the ancients." The book is a collection of recipes only, and provides no information as to diagnosis (which is always assumed) nor any clinical or surgical directions. Some of the prescriptions, especially one for black bile, are evidently influ-

enced by Avicenna, Dioscorides and Alexander of Tralles, but the author did not slavishly copy any of these writings with which he must have been familiar. That the author was a physician and the son of a physician is evident from the passages quoted, and also from such remarks as these: "we have experimented with this remedy and found it perfect"; "I have experimented with this powder and found it perfect, it is without equal in efficacy."

In addition to this manuscript there are also some smaller Coptic fragments in the British Museum, in the Berlin Museum, in the John Rylands Library at Manchester and in the Library of the Vatican.

All the medical papyri of Egypt are anonymous: there are no names in Egypt to compare with those of Hippocrates, Galen or Dioscorides in Greece. The names of several famous physicians who lived in the time of the Pharaohs have come down to us, but it is not known with certainty if they wrote medical books, and if they did, those books have been sunk in the ocean of time.

As the Greek historian, George Grote, remarked: "We possess only what has drifted ashore from the wreck of a stranded vessel." If this be true of such a literature as that of Greece, with her poets, philosophers, and historians, how immeasurably more true is it of Egypt!

CHAPTER V

ANCIENT EGYPTIAN MEDICINE

In Egypt men are more skilled in medicine than any of human kind.

Homer, Odyssey, iv, 227.

The contents of the papyri enumerated in the last chapter, although they abound in difficulties, enable us to form a fairly clear idea of the nature and extent of the real medical knowledge of the Egyptians.

As regards anatomy and physiology, attention has already been called to the important part played by the rite of mummification, but there is one other notable respect in which this custom influenced the growth of science: it provided for the first time opportunities for observations on comparative anatomy. The art of embalming the dead involved the removal of the internal organs of the body, both from the abdomen and the chest. These organs (with the exception of the heart which was almost always left in its place attached to its great vessels) were washed and preserved by the embalmers who made them up into packages and placed them in four ceremonial vases known as the Canopic Jars. During the Twenty-first Dynasty the use of these jars was discontinued and the organs were wrapped in linen and replaced in the body-cavity. This special treatment of the viscera familiarized the Egyptians with the appearance and mutual positions of these organs, and it also enabled them to recognize the analogies between the

internal organs of the human body and those of animals, the latter long familiar from the time-honored practice of cutting up animals for sacrifice and for food. It is a noteworthy fact that the various hieroglyphic signs representing parts of the body, and especially internal organs, are pictures of the organs of mammals and not of human beings. This shows that the Egyptians' knowledge of the internal structure of animals is older than their knowledge of those of man: it shows further that they recognized the essential identity of the two, for they borrowed the signs based upon the organs of animals and used them unaltered when speaking of the corresponding organs of the human body. Thus the sign for "heart," is the heart of an ox, not that of a man, and the word for "throat" or "gullet" is determined with the head and windpipe of an ox. The sign for "womb" is the bicornate uterus of a cow; for "ear," a non-human mammalian ear; for "tooth" a mammalian tusk. There are other signs amongst the hieroglyphs borrowed from mammalian anatomy, among which are the liver, the mammae of an ungulate animal and others. The extent of the knowledge of a nation in respect of any given technical subject can be gauged to some extent by the richness or otherwise of its terminology. In the ancient Egyptian language there are over one hundred anatomical terms, and this fact alone shows that the Egyptians differentiated a great many organs and parts of the body which more primitive people would have grouped together. Whilst on the whole their terminology for the gross anatomy of the body is fairly accurate, they entirely

failed to understand the nerves, muscles, arteries and veins. They had but one word to denote these structures: they appear to have regarded them all as various parts of a single system of branching and radiating channels common to all parts of the body. The same word is used for the vessels communicating with the heart as is employed for the muscles in the prescriptions for stiff joints and rheumatoid complaints. It is only from the context that we can gather what was meant.

As regards physiology it may be mentioned that a long passage in the Ebers Papyrus deals with the heart and its "vessels." The passage is very difficult to understand, and the duplicate of it in the Berlin Medical Papyrus is so corrupt and incorrectly written that it affords us little help. The passage bears the title: "The beginning of the science of the physician. To know the movements of the heart and to know the heart." From a careful study of the text, in spite of all its difficulties, one fact emerges clearly, namely, it was recognized that the heart is the center of the vascular system, for the papyrus specifically states that "there are vessels attached to it for every member of the body." Although of course the Egyptians had no inkling of the circulation of the blood, they nevertheless clearly recognized the relation of the heart to the pulse, and it is stated that the motion of the heart can be detected, not only in the region of the organ itself, but by placing the fingers on the head, the hands, the arms or the legs. A long account is then given of the numbers of vessels which serve every part of the head, limbs and

body. The "vessels" for the nose, for instance, were four in number: two of these conveyed blood and two mucus. There are four vessels within the temples which convey blood to the eyes, and a gloss adds that when the eyes water, the moisture comes from the pupils or from the eyelids, i.e. the water is produced locally and is not conveyed by the vessels. Each part of the body including the internal organs is similarly dealt with, and further passages describe the abnormal behavior of the heart during illness and its effect upon various parts of the body. The vessels described were not all believed to be blood vessels, some of them conveyed air and other secretions. Thus the vessels of the nostrils conveyed air to the heart and to the lungs, those of the testicles conveyed semen, and those of the liver carried moisture and air. The ears, besides being the organs of hearing, were thought to be part of the pulmonary system, for it is stated that "there are four vessels for the two ears, two on the right and two on the left. The breath of life enters by the right ear and the breath of death enters the left ear." In all this jumble of information, which covers several pages of the papyrus, beneath the mass of statements which are manifestly erroneous, there remains a nucleus of correctly observed truth, and shows that in very early times a serious attempt was being made to understand the structure and working of the body.

The paramount importance of the heart was at least recognized, and the medical texts show us that its physiological significance was realized. It was always regarded as the seat

of consciousness and of character, and in this connection it is only necessary to refer to the well-known picture in the "Book of the Dead" which represents the weighing of the heart, which is placed in one pan of a balance and is counterpoised by the emblem of truth in the other. Another proof of the belief that death did not end life is to be found in the fact that the heart, as the most essential organ of the body, was carefully left *in situ* by the embalmers and not removed with the other organs during the process of mummification. This belief is further corroborated by certain religious texts in which it is affirmed for the welfare of the dead man that "his own true heart is with him." In other words the belief is quite clear that the individual could not do without his heart either as a living man or as a mummy.

When we come to consider the pathology of the papyri, we are at once confronted by a host of difficulties. In the first place, the texts are full of philological and lexicographical problems, and they are written in a specialized and concise form which is full of syntactical difficulties. Many passages have been copied from older books, and show evidence of textual corruption. But the greatest difficulty of all is our inability to translate into English a great number of the maladies described, and the names of most of the drugs. There are, for instance, some half-dozen words for which we can find no closer equivalent than "swelling" or "lump," although each term clearly had a specific meaning to the Egyptians: in such cases we have to rely mainly upon the context. Some of these "swellings" are

clearly boils and carbuncles of various kinds, suppurating or otherwise; but others, again, are unmistakably manifestations of bilharzia infection, which was in ancient times, as it is today, a terrible menace to the inhabitants of the Nile valley.

Generally speaking, the maladies with which the papyri are concerned are those which attack the natives of today. Intestinal troubles due to bad water, to worms and other parasites, ophthalmia and a large number of affections of the eyes, boils, sores and bites of insects, skin diseases, bilharzia infection and mastoid disease figure among the many maladies for which the ancient physician had to find remedies. The actual evidence of many of these diseases has been found in Egyptian mummies. The Ebers Papyrus, after some introductory incantations, commences with a long series of remedies for maladies of the stomach and bowels, including the use of purgatives and diuretics, for pains and swellings in the abdomen, and for getting rid of various kinds of intestinal worms. Another group deals with the prevention of vomiting and the promotion of appetite and good digestion. As might easily be supposed, a very long space is devoted to diseases of the eyes, a quite natural state of affairs in a country where eye troubles abound. We find also prescriptions for the lungs, liver and stomach (the Egyptian word for which is "mouth of the heart"); the latter very elaborate, with symptoms, diagnosis and treatment. We have next a series of remedies for the head and scalp, including such complaints as alopecia, and read of ointments to prevent the hair from falling out or from turning

gray. Other sections deal with fevers, and with affections of the mouth, teeth, tongue, throat and ears. A long series of remedies is provided for "relaxing stiffness of the muscles" or for "easing the muscles," clearly rheumatoid complaints; then follows a section devoted to the diseases of women, and this in turn is followed by a collection of household recipes, such as ridding the house of fleas, mice, snakes and other vermin. Between these useful hints and the concluding section, which deals with boils and suppurating sores, is inserted the treatise on the heart and its vessels to which we have already referred. It may be mentioned that the section on the heart occurs also not only in the Berlin Medical Papyrus but in the Edwin Smith Papyrus as well.

The earliest form of surgery known, the rite of circumcision, must be eliminated entirely from the domain of medicine as it was a religious observance. Until recently, all we knew of Egyptian surgery was derived from the concluding passage in the Ebers Papyrus; but the discovery of the Edwin Smith Papyrus provides us with a mass of new information.

As already noted, this papyrus differs from all other medical papyri with the exception of the latter part of the Ebers Papyrus, in that it is not a collection of prescriptions, but a handbook of practical treatment applied to wounds. It deals, therefore, not with remedies, but with cases. The cases are wounds in various parts of the body, starting with the top of the head and proceeding downwards as far as the thorax. The papyrus is incomplete, and in its present state contains forty-eight cases, but originally

the entire work from which it was copied presumably completed the exploration of the body down to the feet. This "head to foot" method is common in Greek medical works. The text abruptly breaks off, however, when it reaches the breast, and the scribe resumed his labors by copying extracts from two other works, one, "Incantations for Driving out Wind in the Year of Pest" and the other "The Book for Transforming an Old Man into a Youth of Twenty."

The cases are presented in a systematic fashion, and they all contain the following elements: (1) title, (2) examination, (3) diagnosis, (4) verdict, (5) treatment. In many cases glosses are added which afford much additional information on the exact meanings of the terms and idioms of the text. The treatment is throughout appropriate and rational, and in this respect it conforms to what we have already mentioned, namely, that rational methods are to be expected when wounds inflicted by human agency are being dealt with. Professor Breasted (who is about to publish a full edition of the document) claims that the discovery of this papyrus destroys the opinion generally held that Egyptian medicine originated in magic. He believes that this document affords evidence that anatomy was practiced for its own sake, and that therefore the Edwin Smith Papyrus is in the true sense a scientific book. While agreeing with the latter opinion, it seems that too much is claimed for this single manuscript, on the very back of which two magical books are written. It does not in the least detract from the value and importance of the document to prefer the opinion that while

it undoubtedly affords evidence that a serious attempt was being made to understand anatomy, it must be clearly borne in mind that it deals only with wounds and not with diseases, for which perforce magical methods had to be employed, for the causes of disease were invisible, impalpable and unknown.

In the section of the Ebers Papyrus devoted to surgical cases, which appear to be boils or tumors, directions are given for lancing and dissecting them. Instructions are given for incising the swelling, for fastening back the edges of the wound, for removing the morbid contents, and for cleansing and dressing it. Surgical instruments have been discovered in Egypt, amongst which are delicate scalpels, probes and forceps. Splints have also been discovered, and these were applied to fractured limbs. In spite of the oft-repeated assertion to the contrary, there is no evidence whatever that tooth-filling, or any other form of dental surgery, was practiced by the Egyptians.

Childbirth did not come within the scope of medical practice in Egypt, although one of the Leiden papyri has spells for facilitating it and for assuaging the pains of labor. Midwives assisted at births, cut the umbilical cord and washed the newborn infants, as we learn from a passage in the Westcar Papyrus. The delivery was always effected with the mother in a vertical position squatting upon a birth stool. The Kahun Papyrus and one section of the Ebers Papyrus deal with the diagnosis and treatment of various vaginal and uterine maladies. In addition to these, methods are given for ascertaining whether conception has taken place or not, and for deter-

mining the sex of unborn children. Experiments for this purpose are also set out on the back of the Berlin Medical Papyrus. Some of these, which have survived until the present day, will be referred to in a later chapter. There are also prescriptions for menstrual irregularity, for prolapsus and for other common female disorders, and also for bringing milk to a nursing mother. Newborn babies were believed to be specially liable to the attacks of disease and of malign spirits, and special spells and prescriptions were composed for their protection. Several collections of such spells have come down to us, the most notable are in a papyrus in the Berlin Museum.

Such, in outline, is the scope of medical practice in ancient Egypt. In the following chapters we shall consider the drugs employed, and survivals from the medical practice of Egypt which have travelled far from their birthplace both in space and time, some persisting until the present day. It has already been suggested that much ancient lore was kept alive by quacks and others who had an interest in duping mankind. The sagacious Francis Bacon, writing four hundred years ago, truly said: "Witches and imposters have always held a competition with physicians."

CHAPTER VI

THE 'POTHECARY

A perfect medicine for bodies that be sick
Of all infirmities to be relieved;
This heleth nature and prolongeth lyfe eke.

The materia medica of the Egyptians was extensive: great numbers of different drugs were employed in their prescriptions, but the same difficulty has to be contended with in dealing with these as has already been noted in connection with the maladies, namely, our inability to identify many of them. The drugs were derived from the animal, vegetable and mineral kingdoms. Most of the animals can be identified; usually their fat, flesh or blood is employed, but if small enough the whole animal is used. Amongst the mammals medicinally employed are the ox, ass, pig, hippopotamus, lion, gazelle, goat, oryx, bat, mouse and hedgehog; amongst the birds are ducks and geese of various kinds, the swallow, the bee-eater, the vulture and several other species at present unidentified. Frogs, lizards, snakes, tortoises and several kinds of fishes, together with a number of invertebrate animals also appear in the prescriptions. In addition to these, the dung of many animals, calcined harts-horn, hoofs, hides and bones are also employed. In the case of the vegetable drugs the number is very large, but it is impossible at present to identify more than a relatively small proportion.

The whole plant, or its leaves, fruit, bark, seeds or juice was employed as a drug. The same difficulties of identification occur in the case of the mineral drugs.

The vehicles for liquid doses are usually water, milk, honey, wine or beer. For emollients and ointments, honey and fats of various kinds are used, goose-grease being especially frequent. Dry medicines are to be crushed or ground, and some of the remedies are boiled, warmed or cooled as the case may be. Medicaments for external use are usually applied to the affected part by rubbing, bandaging or by poultice. Directions are often given as to the administration of prescriptions: for instance, whether before or after meals, etc. The quantities of each drug are meticulously specified in the prescriptions, minute fractional notation often being employed, and from this we may infer that considerable care was used in dispensing.

We may now consider the uses to which a few sample drugs were put. Amongst the animal products used in medicine, we have already mentioned hartshorn, that is to say the substance obtained by crushing the antlers of deer. In the Ebers Papyrus is a prescription "to cool a head that suffers pain," and in it hartshorn is one of ten drugs to be ground up, mixed with water, and applied to the head. In another papyrus hartshorn is used in preparations to drive out the demon which causes disease. In one of these we find it used with the legs of a bird, the hair of an ass, and the dung of swallows and geese with the direction "fumigate the person with it," and in another, hartshorn is to be mixed with the

dung of the cat, crocodile and swallow for a similar fumigation. In a prescription which is "to drive out painful swellings which affect a man in winter and in summer," hartshorn is employed as an ointment, the horn being beaten up with incense and flour and mixed with sweet ale. In another prescription ground hartshorn is used in a fumigation for the ears. However fantastic these remedies may appear to us, hartshorn is a valuable medicine which was used by the Greeks, Syrians and Arabs and is frequent in the medical works of western Europe throughout medieval times up to the present day. Although actual horns are no longer used the name hartshorn has survived in modern pharmacy. "Spirits of hartshorn," now used to designate an aqueous solution of ammonia, was originally applied to the ammoniacal liquor obtained by distillation of horn shavings, and in modern preparations calcium phosphate is added to represent that formed originally from calcined horns.

Among the vegetable drugs, pomegranates, for instance, were cultivated in Egypt in very early times, and the tree is frequently mentioned in the inscriptions and actual fruits have been found in the tombs. In the Ebers Papyrus we find the rind of the pomegranate beaten up and taken in water as a vermifuge, a use to which it was put for many centuries in many different countries. It was put to other uses which are closely paralleled in the Assyrian, Greek and Arabic medical texts. Dill, coriander, cumin, carraway, fenugreek and other herbs familiar in later times for their medicinal properties are

among the many drugs employed in the Egyptian prescriptions. Onions and figs also play an obtrusive part in the medical and magical papyri.

It has often been stated that the mandrake was used by the Egpytians in medicine. There is no evidence, however, in support of this assertion. The word formerly understood to mean mandrake has been proved to be the name of a mineral. Some dried fruits of the mandrake were discovered among the floral remains in the tomb of Tutankhamen, but their use here was decorative and not medicinal. Until these fruits were found, there was no evidence that the plant was even known to the Egyptians. The mandrakes were evidently imported from Western Asia, where the plant is not uncommon and was used by the Assyrians as a drug: it is not, and never has been, a native of the Nile Valley.

Another familiar drug of vegetable origin which was used by the Egyptians is castor oil. Herodotus, Diodorus Siculus, Strabo and Pliny tell us that the Egyptians cultivated the castor-oil plant and obtained from its seeds the oil which they used in their lamps as an illuminant. These writers, and others such as Dioscorides and Oribasius, state that the Egyptian name of the plant is *kiki*. While the identity of castor oil and kiki is unquestionable, the latter word has never as yet been found in the hieroglyphic texts. The ancient Egyptian name for castor oil was *degam*. This degam was used as an illuminant, and an inscription now in the Louvre says: "I have given oil of degam for the lighting of the temples." The plant was used in medicine, and in the following examples, in order to avoid the cumbrous

tripartite word "castor-oil plant," we will refer to it by its botanical name *Ricinus*. From the Ebers Papyrus the following examples may be noted. Ricinus seeds chewed up and taken in beer are used as a purgative. An oil prepared from the seeds was employed as an ointment for sores and boils. There is a passage which bears the title "catalogue of the uses of the degam-plant" which is stated to have been found in an ancient book. The text reads as follows:

> If its stalks are beaten up in water and rubbed upon a head which suffers [some disease of the scalp is evidently meant], it will immediately become well, as though it had never been ill. If a few of its seeds are chewed with beer by a person who is constipated, it will expel the excrement from the body of that person.
>
> The hair of a woman will also be made to grow by means of its seeds. Grind them up, mix them into a mass and apply with grease and let the woman anoint her head therewith.
>
> Oil is also prepared from its seeds as an ointment for sores which emit a foul discharge. The trouble will disappear as though nothing had occurred. It is to be used thus as an ointment for ten days, anointing every morning till it [the discharge] has been driven away. Proved a million times.

Ricinus occurs in another prescription for a disease of the scalp:

> Ricinus seeds 1 [part], Fat, 1, Olive oil, 1. Mix into one. Anoint with it every day.

Again in a prescription to banish illness from every part of the body, Ricinus seeds crushed and mixed with honey are used as an ointment. In the Berlin Papyrus, Ricinus is recommended only once, and that is in a fumigation to expel the evil influence of a god or goddess in causing disease. In the Hearst Papyrus it occurs twice,

and in the London Medical Papyrus, at the end of a long incantation for a burn, we read the words "wrap it in a leaf of Ricinus."

Among the mineral drugs we find minium, alum, salt, haematite, carbonate of soda, natron and other substances used, but there are many of these which have not yet been identified.

There follows a selection of ancient Egyptian prescriptions from the papyri.

Another for expelling excrement and illness from the abdomen of a man.

White gum, 1. Red *tyt*,[1] 1. Human milk. Make into one. To be swallowed by the man.

This is evidently a medicine for constipation. The following is perhaps for gripes:

Another for driving out illness from the side of the abdomen.

'*Efai*-plant, 1. Dates, 1. Cook in fat. Bandage therewith.

There are many prescriptions of "Killing worms." Here are two specimens:

Another. Seeds of the *nozem*-tree, 1. Milk, 1. Honey, 1. Fenugreek seeds, 1. Wine. Warm, beat up, eat for four days. It purges the body.

Another. Fenugreek seeds, 1. Heart of the *mesha*'-bird, 1. Honey, 1. Wine, 1. *Innek*-plant, 1. Sweet ale, 1. Make into a cake. Eat for 1 day.

Among the diseases of the eye, there are many complaints which involve swelling of the eyelids, and this often has the effect of forcing the lashes inwards, causing irritation to the pupil. In such cases the eyelashes were pulled out, and there

[1] An unidentified drug. In these examples such substances will be merely transcriptions of the Egyptian words.

are many prescriptions to prevent them from growing again. For this purpose blood was believed to be efficacious.

Another for preventing the hair [i.e. lashes] from pricking the eye. Frankincense, 1. Lizard's blood, 1. Bat's blood, 1. Clip the hair. Apply it until [the patient] is well.

Another for preventing the lashes growing on the eyelids after they have been pulled out. Incense ground with lizard's dung, 1. Blood of an ox, 1. Blood of an ass, 1. Blood of a pig, 1. Blood of a dog, 1. Blood of an oryx, 1. *Msdem*-salve, 1. Green ointment, 1. Pound these into one mass with the blood. Apply it to the place of the hair after it has been pulled out. It will not grow again.

A short passage embodying symptoms and diagnosis may now be quoted:

If you see a man with a swelling on his neck and who has pain on both sides of his neck, and who has pain in his head; the vertebrae of his neck are stiff and his neck is rigid so that it is impossible for him [lit. "it does not happen to him"] to look down at his belly, for it hurts him [*Symptoms*]. Then you say "He has a swelling on his neck" [*Diagnosis*]. You shall do for it [*Treatment*]: He must anoint it, he must rub it with stibium until he is well at once.

For stiffness of the joints, pains in the muscles and for rheumatoid complaints, most of the remedies are mainly composed of greasy or fatty substances to be used as ointments.

Another for easing [lit. "oiling"] stiffness in any member of a man.

Natron, 1. Beans, 1. Grease, the second day, 1. Hippopotamus fat, 1. Crocodile fat, 1. Fat of the *Adu*-fish, 1. Fat of the Silurus fish, 1. Incense, 1. Sweet frankincense, 1. Honey, 1. Warm. Bandage therewith.

In such prescriptions the mixture of magic and rationalism is evident. Finally, here is a prescription for a sick child:

To be done for a child who suffers from diarrhea.
Burnt ochre made into a pill. If the child is old [enough] let him eat it in his food. If he is swaddling-clothes [i.e. very young] let it be rubbed into his nurse's milk [lit. "the milk which his nurse emits"] for four days.

As the medical papyri of Pharaonic times contain in the aggregate over two thousand prescriptions, it is difficult to select out of this number a small series which will convey an adequate impression of their nature and scope. A great many of the drugs employed are fantastic and magical, and there is generally a preference shown for rare substances which are difficult to obtain. All this enhanced the reputation of the magician. If he supplied the remedies, one is tempted to wonder how he got his supplies of lion fat, crocodile fat, oryx fat and other similar preparations. Perhaps the homely goose-grease done up in separate pots and bearing different labels solved the problem! In spite of such elements, however, a careful study of the texts discloses many rational drugs underlying the magical and fantastic ones, and a number of the most valuable drugs in modern pharmacy were first put to medicinal uses by the Egyptians.

By way of comparison with the prescriptions quoted above, we will add a few taken from Greek medical papyri found in Egypt, and from the Demotic and Coptic texts of later times. The following remedies for the ears are taken from a Greek medical papyrus of the second or third century A.D.:

Stoppings for the ear against ear-ache. Pound some Egyptian alum and insert into the ear an amount equal to the size of a pea.
Another. Anoint a persea-leaf and insert.

Another. Thoroughly moisten a flock of wool with the gall of an ox; roll up and insert.

Another. Pound myrrh and alum in equal quantities and insert.

Clysters for the ear against ear-ache. Dilute frankincense with very sweet wine and syringe the ear: or use for this purpose the injections described above.

Another. Rinse with warm onion-juice.

Another. Syringe with gall of a bull, or goat, or sheep, or other similar kind of gall, warmed.

Another. The sap of a pine-tree, warmed, to be used in the same way.

The following are from the London-Leiden Magical Papyrus (third century A.D.):

Medicament for an ear that is watery. Salt, heat with good wine; you apply to it after cleansing it first. You scrape the salt, heat with wine; you apply to it for four days.

This is rational enough, and not so very far removed from the ear-drops composed of spirits of wine and boracic powder which are prescribed today by physicians for discharge of the ears. The next is magical in character:

Gout. You make the man sit down; you place clay under the feet of the man; you put . . . to it, his feet resting on it; you ask the man, saying, "Has it hardened?" for three days. Thereafter you take an ant (?), you cook it in oil of henna; you anoint his feet with it. When you have finished, you take Alexandrian figs and dried grapes and potentilla; you pound them with wine; you anoint him besides (?) these; and you blow on him with your mouth. [Translation of Griffith and Thompson.]

Finally from the great Coptic Medical Papyrus (ninth or tenth century A.D.) the following examples may be selected from the 237 prescriptions it contains:

A good powder for the eyes. Armenian borax, 10 obols; white lead, 2 ob.; pepper, 1 ob.; ginger, 1 ob.; verdigris,

⅔ ob.; starch, 2 ob.; salammoniac, 1 ob. Pound them well, strain through a fine sieve; apply to the eyes which are dim and they will become quite clear.

Ear which suffers acutely. Opium, calf's fat, milk: melt them down together, warm them and apply to the ear. The pain will stop instantly. But do not administer this remedy to a man until you have received your fee.

This infallible cure evidently worked so quickly that the physician is advised to secure payment in advance!

A tooth which has to be extracted with instruments [lit. "iron"]. Hellebore of good quality and gall; apply to the region of the cheek where the molar is which you wish to extract, and you will be astonished!

Anyone who has worms in him. Camomile, mastic, rue, wine: pound them, mix with the wine, and let him drink it.

Powder which cauterizes quickly: Iris, 4 dr.; vetch, 4 dr.; flakes of copper, 2 dr.; aristolochia, 4 dr.; roasted resin, 16 dr.; incense, 2 dr.; white vitriol, 20 dr. Pound them well, make into a powder, apply.

White plaster for treating persistent wounds, and bites of dogs or men; it is very good. Burnt lead, 8 oz.; wax 2 lb.; oil, 1 lb.; pine resin, 2 lb.; sweet wine, 10 measures; melt them over the fire and apply.

Human bites were thought by the ancients to be very serious. The Ebers and Hearst Papyri devote several prescriptions to their treatment, Oribasius has a special chapter on the subject, and Pliny and the medieval medical writers also refer to it.

CHAPTER VII

ASSYRIAN MEDICINE

Babylon, the splendid ornament of Chaldea, and Nineveh, the "divinely great city," represent less the commencement of intellectual development than the most historically important phase of the same.

Max Neuburger.

The Babylonians had no physicians, according to Herodotus, and they brought their sick into the market-places in order that passers-by might confer with them upon their symptoms in the hope that the patient might elicit from someone who had been similarly afflicted advice as to how to proceed to effect a cure. Whether this be true or not, their neighbors the Assyrians possessed considerable medical knowledge of which a mass of documentary evidence has come down to us. Garrison observes: "We learn from the Code Hammurabi (2250 B.C.) that the medical profession had advanced far enough in public esteem to be rewarded with adequate fees, carefully prescribed and regulated by law."

Until lately, but few Assyrian medical texts had been published. From their very nature, inscribed as they are in cuneiform characters on brittle clay tablets, these texts are extremely fragmentary and often very difficult to read. In the ruins of the royal library of King Ashurbanipal (668–626 B.C.) at Nineveh (the mound Kouyunjik, excavated by Layard in 1849), thousands of clay tablets have been found. In the reign of this king Assyrian literature may be said to have

reached its high-water mark, both as regards quantity and merit. From this famous site vast quantities of historical, literary, religious, magical, astronomical and medical texts have been recovered. It is to R. Campbell Thompson that we are indebted for most of our knowledge of Assyrian medicine, and he has for years made it a special study. In 1906 he commenced a systematic study of the medical texts, and at once came to the conclusion that the material must be worked over as a whole, and that to continue to publish isolated fragments would lead to no solid result. Accordingly he set to work to collect, transcribe, and study this great mass of tablets, a task which occupied many years, and which was interrupted by the World War. Some 660 tablets in the British Museum, nearly all of them previously unpublished, were examined and collated, and the cuneiform texts issued in a series of 107 plates by Campbell Thompson in 1923. Having published the texts, the next step was to translate them, but before doing so, another and very important point had to be settled and this is best described in the author's own words:

> The work of editing so many texts is a long business; and it became obvious, when I set about them again after my return from the War, that the old method of leaving the vegetable drugs unidentified, or translated haphazard, would lead us nowhere. No satisfactory translation of these texts was possible until the plants had been in some measure worked out; and to this end I spent a large part of two years at work on the 250 vegetable drugs known to the Assyrian botanists.

The results of these labors are contained in a special volume entitled "The Assyrian Herbal," which appeared in 1924. In this work many wrong

identifications were corrected, and a large series of plants identified for the first time. A year later a second volume appeared dealing with the mineral drugs and with the chemistry of the Assyrians. At the same time, the translations of the texts were begun, and this work is still in progress, two parts of it having appeared in the *Proceedings of the Royal Society of Medicine*.

The student of Assyrian is accordingly in a far better position to investigate the subject, than the student of Egyptian medicine, for in the latter a great part of the preliminary work still remains to be done.

From the material which is now at our disposal, we can at once perceive that there is a great similarity between the Egyptian and the Assyrian medical texts; both are strange mixtures of rational therapeutic treatment with magical spells and incantations. There is some difference, however, in the method of setting out the prescriptions. In the Egyptian papyri the name of the ailment is usually stated in the title, thus "prescription for driving away swellings," "prescription for a pain in the head" and so on. The Assyrian prescriptions have no distinct titles, but usually convey some notion of the symptoms or diagnosis of the disease in the opening phrase: thus "if a man's head has a scab, thou shalt" do so and so, or "if a man's teeth hurt, thou shalt take" such and such drugs and apply them; "if the accident of a blow has fallen upon him," etc. Another point of difference lies in the fact that in the majority of Egyptian prescriptions, the quantities of each drug to be used are stated: this detail is often lacking in the Assyrian texts.

Interspersed amongst the prescriptions there are incantations, and often also the "Ritual" to be performed where the spell is recited. These are the oral rites and the manual rites which we noted when discussing Egyptian magic. The following is a specimen of an incantation for the eyes:[1]

Incantation for a sick eye.
Ritual for this: this is for red wool, a thread thou shalt spin, tie seven knots, as thou tiest them recite the charm, bind on his sick eye.
Charm. O failing eyes, O painful eyes, O eyes sundered by a dam of blood! Why do ye fail, why do ye hurt? Why has the dust of the river come nigh you, or the spathe of the date-palm whereof ye have chanced to catch the pollen which the fertilizer hath been shaking? Have I invited you, Come to me? I have not invited you, come not to me, or ever the first wind, the second wind, the third wind the fourth wind cometh to you!

The use in magic of a thread with seven knots, which is frequent, is paralleled, as we have already seen, in the Egyptian magical texts. The following is a spell for blindness:

Incantation for a sick eye.
Ritual for this, as before.
Charm. In heaven the wind blew and brought blindness to the eye of the man: from the distant heavens the wind blew and brought blindness to the eye of the man. Unto the sick eye it brought blindness; of this man his eye is troubled, his eye is pained. The man weepeth grievously for himself.
Of this man, his sickness Ea hath espied and said, "take pounded roses, perform the charm of the Deep, and bind the eye of the man." When Ea toucheth the eye of

[1] All the translations of the Assyrian texts here given are those of Campbell Thompson. To facilitate reading, I have omitted the notes and various critical marks of the original edition, including brackets and notes of interrogation.

the man with his holy hand, let the wind which hath brought woe to the eye of the man go forth!

The treatment of disease by magical means presupposes a belief in a supernatural causative agent. Amongst the incantations, for instance, there is one called "Charm against the Hand of a Ghost" and in another toothache is attributed to the anger of a dead man whose funerary offerings have been neglected. The efficacy of the drugs was produced, or at least increased by magical means. Before passing on to the prescriptions, we will quote one further incantation, which embodies the adage that like influences like.

Charm. Sound front, sound back, smitten front, smitten back. Flesh multiplieth flesh, blood produceth blood, dung createth dung. Perform, O Gula, the high Charm of Life! Let them bring nigh the cataplasms which thou hast arranged and grant recovery!

As we have already noted, the texts are very fragmentary, and although the general sense of most of them is easily understood, comparatively few are sufficiently undamaged to be suitable for quotation. The following selection is therefore quite arbitrary and is made from the prescriptions which are best preserved.

If a man's eyes are sick and full of blood, unguents only irritating the blood, blood and tears coming forth from his eyes, a film closing over the pupils of his eyes, tears turning to film, to look oppressing him: thou shalt beat leaves of tamarisk, steep them in strong vinegar, leave them out under the stars; in the morning [i.e. on the morrow] thou shalt squeeze them in a helmet: white alum storax, "Akkadian Salt," fat, cornflower, nigella, "gum of copper," separately shalt thou bray: thou shalt take equal parts of them, put them together; pour them into the helmet in which thou hast squeezed the tamarisk; in curd and *sunis*-mineral thou shalt knead it, and open his eyelids

with a finger and put it in his eyes. While his eyes contain dimness, his eyes thou shalt smear, and for nine days thou shalt do this.

This prescription is followed by three alternative preparations to be similarly used: here again we have an analogy with Egyptian prescriptions, for in the latter in nearly every case a number of alternative remedies is given for each complaint. The text we have just quoted is almost entirely therapeutic, the only magical element in it being the direction to leave the medicine under the stars, i.e. to expose it to the magical influence of the stars. Among the shorter prescriptions for the eyes the following may be noted:

Thou shalt disembowel a yellow frog, mix its gall in curd, apply to his eyes . . .

Blood from a pig's heart thou shalt pour into his eyes . . .

If a man's eyes are full of blood, thou shalt bray yellow sulphide of arsenic in curd, apply.

There are many incantations and prescriptions for toothache. Probably in Assyria, as in Egypt, dental troubles were frequent. As regards Egypt, it is interesting to observe that dental caries is exceedingly rare in the predynastic and protodynastic people, and among the poorer classes it did not become at all common until modern times. But these people ate coarse food in which a considerable quantity of sand was mixed, consequently the teeth rapidly wore down and exposed the pulp-cavities, where septic infection took a readier hold than in the hard enamel and dentine of the teeth themselves. Hence it is common to find alveolar abscesses without

dental caries. But the latter became common amongst the wealthier classes in the Pyramid Age, who had learned luxury and no longer subsisted on the simple diet of their predecessors. At every subsequent period the same state of affairs is found, namely the wide prevalence of every kind of dental disease amongst wealthy people of luxurious diet and much greater immunity from it amongst the poorer classes who fed principally on uncooked vegetable food. Probably the same state of affairs existed in Assyria. The Egyptians believed that the cause, or one of the causes of toothache was the gnawing of a worm, and in Assyria the same belief is found. This belief is very widespread and has persisted till fairly recent times. In this connection the following Assyrian incantation for toothache is particularly interesting both from the magical and mythological points of view:

> Charm. After Anu made the heavens, the heavens made the earth, the earth made the rivers, the rivers made the canals, the canals made the marsh, the marsh made the Worm. The Worm came weeping unto Samas, came unto Ea, her tears flowing: "What wilt thou give me for my food, what wilt thou give me to destroy?" "I will give thee dried figs and apricots." "Forsooth, what are these dried figs to me, or apricots? Set me amid teeth, and let me dwell in the gums, that I may destroy the blood of the teeth, and of the gums chew their marrow. So shall I hold the latch of the door." "Since thou hast said this, O Worm, may Ea smite thee with his mighty fist."

The Assyrians were skilled in the preparation of medicines. Whilst, as we have already indicated, magic played a large part in the treatment of disease, yet the drugs in the prescriptions are, in the main, wholesome and rational.

It may be mentioned that the tablets from Koŭyunkik, which form the basis of this brief summary, all date from the seventh century B.C., but there is evidence that they are copies of older texts, from their similarity to the medical texts found at Ashur which are some centuries older.

[Since this chapter was written, Dr. Campbell Thompson has published two further collections of translations of Assyrian medical texts. These deal respectively with diseases of the stomach and with diseases caused by "the hand of a ghost." The two articles will be found in the *Revue d'Assyriologie* and in the *Journal of the Royal Asiatic Society*, for the year 1929.]

CHAPTER VIII

THE LEGACY OF THE PAST: CONCLUSION

The old ideas, however, had to wait for special times and circumstances before they could be forced into social service and for a series of enlightened and determined men of genius to realize and exploit their great possibilities.
G. Elliot Smith.

With the rise of Hippocrates and the great physicians of the Hellenistic world new life was infused into the science of medicine. These men of genius, however, did not extinguish the ancient medical lore that had held sway for centuries before their time. Much of it survived and spread far and wide, and the Greeks themselves borrowed not a little from the medicine of Egypt and Mesopotamia.

In classical times the Egyptians had a great reputation for their medical learning. Herodotus stated that in Egypt all places abounded with physicians each of whom was a specialist, applying himself to the study of one branch of medicine. "Some physicians are for the eyes, others for the head, others for the teeth, others for the parts about the belly, and others for internal disorders." The same writer tells us that Cyrus sent to Egypt for a physician, and that Darius believed that the Egyptians "had the highest reputation for their skill in the healing art." Homer stated that the Egyptians had more skill in medicine than any other race, and other classical writers have spoken of them in similar terms.

Medicine in Egypt, as we have already seen, was closely connected with magic and religion,

but the Egyptians had no special deity of medicine until late times, when a famous physician and sage who had lived in the Third Dynasty was posthumously raised to the honor of divine status and became the god of medicine. This was Imhotep, who was called by the Greeks Imouthes and identified by them with Asklepios, or Aesculapius, their own god of medicine. Similar honors were paid posthumously to another famous sage who had been a minister under Amenophis III, a Pharaoh of the Eighteenth Dynasty. This sage, Amenophis the Son of Hapu, was not during his lifetime particularly connected with medicine, but in Ptolemaic times he appears side by side with Imhotep in the bas-reliefs which cover the walls of several of the temples built by the Ptolemies. In the last centuries of the pre-Christian era, these temples were sought by the sick who implored the gift of restoration to health from the two deified men who were then accounted as gods with special powers of healing. At an earlier period the god Amun and several of the minor gods of Thebes wrought miraculous cures, and many votive tablets, offered by the grateful patients, have been found.

If in early times the Egyptians had a god of medicine, this god was Thoth, to whom was attributed the invention of the art of writing and of all wisdom and science.

We have already spoken of several well-known drugs which were used by the Egyptians, and which have had universal vogue. Such are hartshorn, castor oil, cumin, coriander and others. But in addition to these more obvious examples, many of the drugs and their properties which

occur in the works of Dioscorides, Galen, Pliny and others were clearly borrowed from the Egyptians. These writers are the source from which the compilers of herbals and books on drugs of later ages principally drew for their material, and the works of classical authors are thus the stepping-stones by which much Egyptian medical lore reached Europe. Egyptian influence can also be traced in Hebrew, Syriac, Arabic and Persian medical books. The compilers of the herbals and books of popular medicine of the sixteenth, seventeenth and eighteenth centuries, in spite of their oft-repeated claims to originality, are often passing on medical knowledge which had its origin on the banks of the Nile many centuries earlier. From these popular writers, the persistence of much of the surviving folk-medicine of Western Europe is probably due, but it is likely also that many customs and beliefs had penetrated even as far as the British Isles long before the invention of printing and were transmitted by the migrations and contact of peoples.

It is evident that the works of classical writers were not the only means by which Egyptian medicine reached Western Europe. Many early medical manuscripts of the fourteenth century, for instance, are drawn up in precisely the same way as the Egyptian papyri. The prescriptions are headed in exactly the same manner as those in the Ebers and other papyri, and each is followed by a series of duplicates, headed by the word "Another," as are those of the papyri. Charms and incantations are interspersed amongst the prescriptions which are very similar to those

of the Egyptian documents, although the names of Horus, Isis and the lesser divinities invoked in the papyri are replaced by those of Christ, the Virgin Mary and the Christian Saints. At the end of the prescriptions the words are often added "tried and found perfect," "probatum," etc. just as the Egyptian prescriptions often end with the words "a perfect remedy," and so on. These points taken cumulatively, and in conjunction with the similar nature of the prescriptions, leave little doubt that the substance of the Egyptian medical books had reached Europe long before the more obvious modes of communication existed.

To cite a few examples of such transference and survival, one of the Egyptian papyri written about 1400 B.C. prescribes a skinned mouse as a remedy for an infantile ailment; but there is evidence that the use of the mouse as a child's medicine is many centuries older in Egypt than this first written record of it. In a predynastic cemetery in Upper Egypt remains of mice were discovered in the alimentary canals of the bodies of children under circumstances which prove that the little animals had been skinned before they were eaten. The mice were evidently medicinally administered to the children as a last resource before they died. There is abundant literary evidence of the medicinal use of the mouse for various purposes, but usually for children, throughout classical, medieval and later times, and the custom of using mice as a medicine is not wholly extinct in parts of Europe today. There are people still living in England and Scotland who in their childhood

had been made to swallow skinned mice as a cure for whooping-cough and other complaints. This affords a striking example of the persistence of a remedy for more than sixty centuries.

In two prescriptions in the Ebers Papyrus the spine (the quill, not the backbone) of a hedgehog calcined and beaten up with grease is used as an ointment for alopecia. Dioscorides also states that burnt hedgehog's spines are good for alopecia, and this remedy has survived in rural districts almost to the present day.

In the Egyptian medical papyri the "milk of a woman who has borne a male child" is frequently employed in medicines, and this again is to be found in classical medical writings, in the medical works of the Middle Ages, and in the later dispensatories and collections of popular recipes.

The blood of a bat as a depilatory is mentioned several times in the medical papyri. It is found in some connection in the writings of the School of Salerno and in many other works.

In the Kahun Papyrus, and on the back of the Berlin Medical Papyrus, there occurs a collection of experiments for the purpose of ascertaining whether a woman has conceived, or not, and whether she is sterile or not. One of these is to be found almost unaltered in the Hippocratic work "De Sterilibus," and another occurs in the London-Leiden Medical Papyrus (third century A.D.) and in many later books. It is still to be found in a well-known popular treatise on midwifery which is printed and sold at the present day.

To these examples of the survival of Egyptian elements in popular medicine, which might be

multiplied almost indefinitely, could be added other instances of the persistence of the arbitrary magical virtues ascribed by the Egyptians to various drugs, instances that date from the early times when magic, and not rational therapeutics, was the principal agent in the art of healing.

When discussing Assyrian medicine, mention was made of the belief, that was also held in ancient Egypt, that dental disease is caused by worms. This belief is widespread today: it is found in Western Asia, in China, in the Malay Peninsula and in many other places, and it was current in Europe a century ago. An example of a remedy for worms in the teeth from a fourteenth century medical manuscript follows:

> For toth-ache of wurmes. Take hennebane-seede and leke-seed and poudre of encens, of iche Ilike mychil, and ley hem on a tyl-ston hot glowyng and make a pipe of latoun [latten] that the nether ende be wyde that it may over-closen the sedes and the poudre and hold his mouth there over the ouerende that the eyre may in-to the sore tothe and that wil slen the wurmes and do away the ache.

The popular belief in dental worms is echoed by Shakespeare in "Much Ado about Nothing:" "What! sigh for the toothache? Where is but a humour or a worm."

Reference has already been made to the fact that the oft-repeated statement that the mandrake was used by the Egyptians in medicine is entirely without foundation. The Assyrians, however, knew the plant and used it frequently in their prescriptions. Dr. Campbell Thompson has shown that our word "mandrake" is merely the Assyrian word "plague-god plant" slightly changed by

the merchants who introduced the word into Europe as the Greek *mandragora*, which is derived from the Assyrian name *nam-ta-ira* by the simple metathesis of the letters *m* and *n*. He has also shown that the Greek word *sukaminos* is similarly derived from the Assyrian name of the mulberry, *musukanu*, by transposing the first two consonants: the Greek name, for which there has hitherto been no satisfactory etymology, was thus brought with the tree from the East.

In Egypt and Assyria, but especially the former, medical science had its birth. We have seen that on the banks of the Nile more than three thousand years before the Christian era a definite attempt was being made to cope with the problems of life and death. The driving motive of all the human efforts out of which the science of medicine has grown was the endeavor to prolong and protect life and to avert extinction. The acts of both the embalmer and the physician were concerned with devising the means of protecting the individual against the dangers which threatened his existence, dangers which we have seen were believed to be of supernatural origin. The magical procedures used in both cases had a single object in view: the giving of life which death and disease threatened. The embalmer by his manipulations contrived to preserve the physical frame of the body, and the magician infused into it the vital substance which was hostile to the demons of disease and destruction and essential to the continuance of existence.

The peculiar circumstances arising out of Egyptian customs and beliefs provided the

facilities for real medical research which were unattainable anywhere else in the world. The Greek anatomists, as we have seen, were able to practice dissection of the human body in Egypt in the third century B.C., and the medical papyri show that the Egyptians themselves in early times had some knowledge of the structure and functions of the body which the Greeks for many centuries had lacked. If Egypt cannot compete with Greece in scientific medical knowledge and thought, she at least inaugurated what others have developed and led the way to facilities for the advancement of knowledge and research which could not otherwise have existed. The debt of civilization in Egypt is incalculable.

This little book may fittingly be closed with a quotation from Burton:

> But I am over-tedious in these toyes, which howsoever in some men's too severe censures they may be held absurd and ridiculous, I am the bolder to assert, as not borrowed from circumforanean rogues and gipsies, but out of the writings of worthy philosophers and physicians.

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The student who wishes to investigate more fully the subjects outlined in this book will find full bibliographical references in the author's "Magician and Leech."[1]

A large amount of interesting information on Egyptian medicine will be found in J. B. Hurry's "Imhotep."[2] For an account of the technique of mummification and the conditions of medical interest revealed by mummies, reference may be made to "Egyptian Mummies" by G. Elliot Smith and Warren R. Dawson[3] where technical details and references are given.

For Assyrian medicine, R. Campbell Thompson's "Assyrian Herbal" and "Chemistry of the Ancient Assyrians"[4] and his translations of Assyrian medical texts[5] will provide a wealth of interesting material.

For the ideas on sickness and disease and their cure held by a primitive people in modern times, the late W. H. R. Rivers' "Medicine, Magic and Religion"[6] will suggest interesting comparisons with the customs and beliefs of antiquity dealt with in this book.

Finally, for a general view of the evolution and development of medical thought and practice, the student should read the standard medical histories, such as those of Garrison,[7] Neuburger,[8] Withington[9] and others.

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